

Rediscovery of *Choanopoma? smithianum* Pfeiffer, 1866 (Annulariidae) from Haiti and designation of a neotype, with the description of two new species of *Weinlandipoma* Bartsch, 1946

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ABSTRACT

Choanopoma? smithianum Pfeiffer, 1866, was described from “monte Platon” on the western end of the Tiburon Peninsula of Haiti. The species has never been figured and the type specimens are apparently lost. Surveys of the region in 1984 and 2006 rediscovered this “lost” species, which is here allocated to *Weinlandipoma* Bartsch, 1946. A neotype is designated based on this material, the species is redescribed, and compared with similar taxa. Two additional species are described as new, *Weinlandipoma auduboni* and *Weinlandipoma macayaense*.

Additional Keywords: Gastropoda, Annulariidae, Hispaniola, *Weinlandipoma*, new species

INTRODUCTION

Ludwig Pfeiffer often described species without immediate illustration although some taxa might subsequently be figured by him or others. In 1866 Pfeiffer described *Choanopoma? smithianum* from “in monte Platon insulae Haiti.” He questioned whether his species belonged in *Choanopoma* because none of his five specimens retained an operculum, a diagnostic characteristic of the genus. The species was never figured. Although the species was mentioned again by Pfeiffer (1876) and listed by Tryon (1867), Kobelt (1880), and Crosse (1891), no additional information was given. Bartsch, in his 1946 review of the Hispaniolan annulariids, uncharacteristically overlooked this name. Watters (2006), based on the facts that the type could not be located at The Natural History Museum (UK) or the Berlin Museum für Naturkunde, where much of Pfeiffer’s material that had not been destroyed during World War II resided, and that it had never been illustrated, suggested that the taxon was a *nomen dubium*. But

investigation of the type locality (Grego and Šteffek, 2007) revealed a species that undoubtedly represents Pfeiffer’s lost *Choanopoma? smithianum* as well as previously unrecognized taxa.

Pfeiffer’s type locality of “in monte Platon insulae Haiti” was stated to be “30 engl. Meilen nordöstlich von Aux-Cayes.” This measurement is based on road miles, not straight distance. This site is identifiable as the area of the well-known Citadelle de Platons, on “monte Platon” located on the Plain of Formón south of Pic Macaya (the second highest mountain in Haiti at 2,347 m) and Pic Formón (2,219 m). It is reasonable to assume that the original collector had visited the area to view this impressive fortress. Citadelle de Platons was used during the Haitian Revolution (1791–1804) to guard against Napoleon’s expeditionary force led by Charles Leclerc to recapture the French colony and reinstate slavery. There is also an adjacent village of Les Platons. Collections at Citadelle de Platons and 27 other neighboring sites near Morne Cavalier, Cay Dernière Jeudi, and the Pic Ouasac ridge revealed only four annulariid species: *Weinlandipoma gonavense* (Weinland, 1880), and three additional species of *Weinlandipoma*. Pfeiffer’s brief description could only apply to one of the four species encountered based on circumstantial evidence presented here. We believe that the four *Weinlandipoma* taxa near and at the type locality are *Weinlandipoma smithianum*, *Weinlandipoma gonavense*, *Weinlandipoma auduboni*, new species, and *Weinlandipoma macayaense*, new species.

Clench (1935) collected in the general area but reported only on the Urocoptidae. Thompson (1986) collected extensively in the (then proposed) Parc National Pic Macaya. This material is at the Florida Museum of Natural History (UF) and is included in this study. The collections by Grego and Šteffek at thirteen sites and the collections by Thompson at eleven sites resulted in 1,558 specimens of four *Weinlandipoma* species. Some of these sites were figured and discussed in more detail in Grego and Šteffek (2007).

¹ Posthumously

MATERIALS AND METHODS

Unless noted otherwise, all sites are in the Department du Sud, Haiti. Table 1 lists the material examined and the collections sites. Descriptions and measurements were based on shells oriented with the spire up and the aperture facing the viewer. Minimum and maximum dimensions were based on all adult specimens available. Abbreviations used in text are: BMSM, The Bailey-Matthews Shell Museum, Sanibel, Florida, USA; GTW, Collection of G.T. Watters, USA; Grego coll., Jozef Grego Collection, Slovak Republic; NHMUK, The Natural History Museum, London, UK; OSUM, Ohio State University Museum of Biological Diversity, Columbus, USA; UF, Florida Museum of Natural History, Gainesville, USA.

SYSTEMATICS

Family Annulariidae Henderson and Bartsch, 1920
Subfamily Annulariinae Henderson and Bartsch, 1920

Genus *Weinlandipoma* Bartsch, 1946

Type Species: *Choanopoma blandii* Weinland, 1880, by original designation.

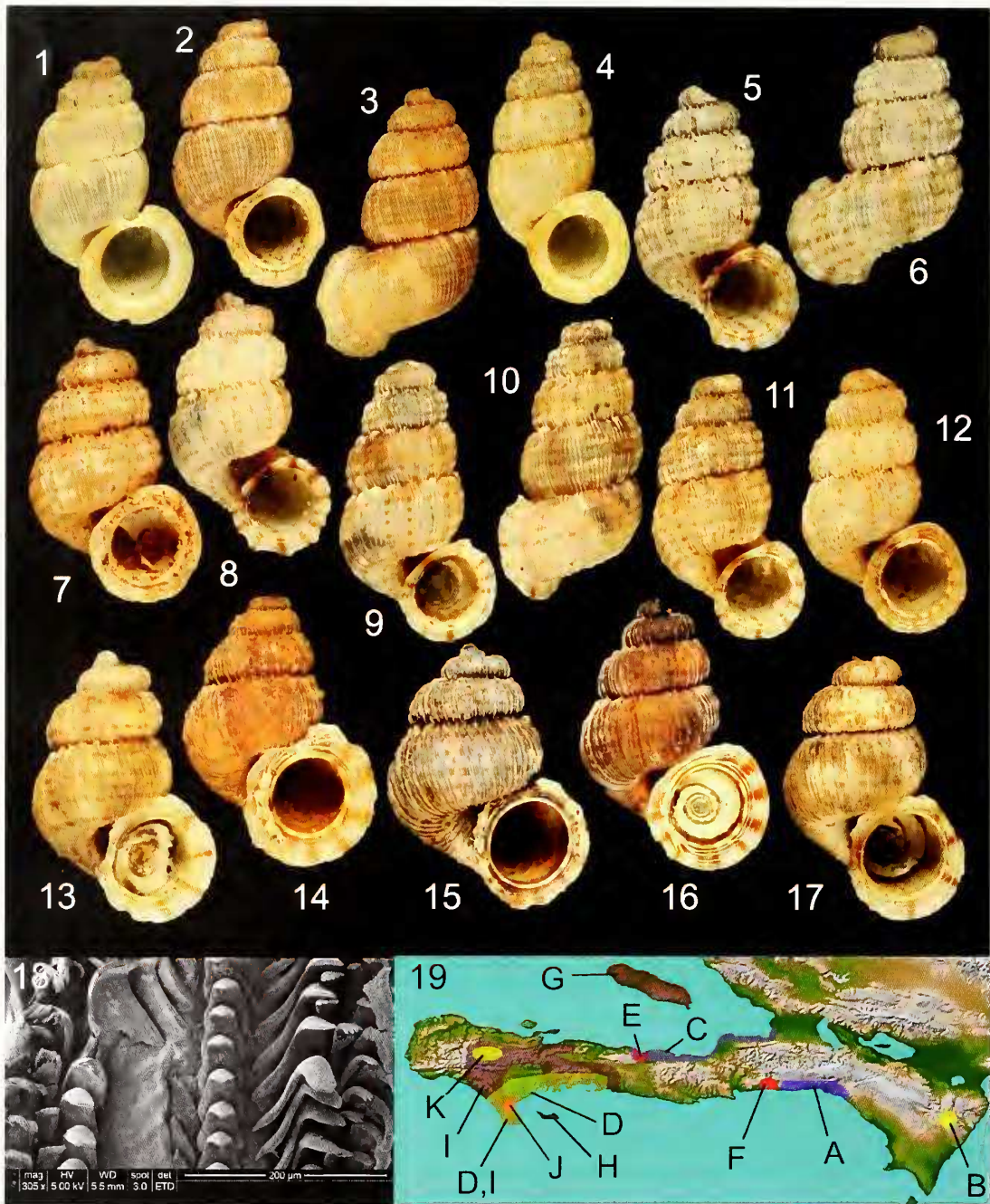
Weinlandipoma smithianum (Pfeiffer, 1866)

(Figures 1–4, 18)

Choanopoma ? *Smithianum* Pfeiffer, 1866: 88–89; Pfeiffer, 1876: 157; Watters, 2006: 484, 557 [*asanomendubium*].
Choanopoma smithiana Pfeiffer, 1866. Tryon, 1867: 99.

Table 1. Localities and specimens. **A**, *Weinlandipoma auduboni*; **G**, *W. gonavense*; **M**, *W. macayaense*; **S**, *W. smithianum*.

Locality	A	G	M	S
Grego coll., Citadelle de Platons, cleared area around fortress, 727 m elevation, 18.2702° N, –73.9709° W.	1	4	1	3
Grego coll., near Morne Cavalier, sinkholes in wet limestone forest, 1,116 m elevation, 18.3227° N, –74.0204° W	3	102	10	0
Grego coll., near Morn Cavalier, Parc National Pic Macaya, foot of Mt. Ouasac, wet limestone outcrops in cleared forest, 1,341 m elevation, 18.3391° N, –74.0304° W	4	60	5	0
Grego coll., Pic Fornón, Parc National Pic Macaya, limestone boulders in cleared wet limestone forest, 1,200 m elevation [coordinates unknown]	0	351	0	0
Grego coll., Cay Dernière Jeudi, Parc National Pic Macaya, wet limestone outcrops at edge of forest, 1,306 m elevation, 18.3397° N, –74.0210° W	0	366	0	0
Grego coll., Cay Dernière Jeudi, Parc National Pic Macaya, wet limestone outcrops at edge of forest, 1,331 m elevation, 18.3397° N, –74.0210° W	0	114	0	0
Grego coll., near Morne Cavalier, 1 km W of Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,191 m elevation, 18.3267° N, –74.0297° W	2	20	6	0
Grego coll., Pic Fornón, off path between Morne Cavalier and Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,202 m elevation, 18.3254° N, –74.0262° W.	0	17	9	32
Grego coll., Pic Ouasac, deforested pine slope, Parc National Pic Macaya, 2,122 m elevation, 18.3576° N, –74.0279° W	0	73	0	0
Grego coll., near Morne Cavalier, 2 km W of Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,258 m elevation, 18.3267° N, –74.0297° W	0	20	0	0
Grego coll., Pic Ouasac, Parc National Pic Macaya, deforested pine slope, 1,818 m elevation, 18.3519° N, –74.0282° W	14	33	0	1
Grego coll., Pic Ouasac, Parc National Pic Macaya, deforested pine slope, 1,818 m elevation, 18.3519° N, –74.0282° W	0	77	0	0
Grego coll., Pic Fornón, Parc National Pic Macaya, around cave 700 m W of school, cleared wet limestone forest, 1,020 m elevation, 18.3247° N, –74.0130° W	0	21	0	0
UF 77446, 77448, 77453, Morne Formond, Parc National Pic Macaya, 1,650 m elevation, ca. 18.3525° N, –74.0229° W	0	26	0	0
UF 32226, 6 km E of Cavaillon, 200 m elevation, 18.3035° N, –73.6013° W	0	23	0	0
UF 32278, Camp Perrin, 200 m elevation, 18.3274° N, –73.8602° W	0	9	0	0
UF 32269, 1 km S of Camp Perrin, 200 m elevation, 18.3171° N, –73.8601° W	0	38	0	53
UF 32732, Trou Woch Sa Wo, ca. 1 km SSW of Camp Perrin, 18.3188° N, –73.8553° W	0	8	0	0
UF 32323, 7 km NW of Port Salut, 18.1433° N, –73.9647° W	0	7	0	0
UF 32385, 10 km NW of Port Salut, 18.1663° N, –73.9797° W	0	5	0	0
UF 33265, 6 km SSE of Fond des Blancs, 210 m elevation, 18.2341° N, –73.0984° W	0	30	0	0
UF 33375, 3 km E of La Vallée, Nippes Department, ca. 18.4333° N, –73.4346° W	0	6	0	0
UF 32361, 1 km SE of Roche-à-Bateau, 18.1785° N, –73.9913° W	0	3	0	0
UF 48134 – Plaine Sa Wo, [not located, presumably near Trou Woch Sa Wo, ca. 1 km SSW of Camp Perrin, 18.3188° N, –73.8553° W.]	0	0	0	1
Totals	24	1413	31	90



Figures 1–19. *Weilandipoma* and their distribution. **1–4.** *Weilandipoma smithianum* (Pfeiffer, 1866). All from Citadelle de Platons. **1.** Grego coll., 9.5 mm length; **2–3.** Neotype of *Choanopoma smithianum* Pfeiffer, 1866. NHMUK 20120258, 9.6 mm length; **4.** Grego coll., 10.6 mm length. **5–8.** *Weilandipoma auduboni* new species. **5–6.** Holotype UF 451538, near Morne Cavalier, 1 km W of Cay Michel, 7.6 mm length. **7.** Paratype OSUM 37268, Citadelle de Platons, 6.8 mm length; **8.** Paratype BMSM 17935, near Morne Cavalier, 1 km W of Cay Michel, 7.2 mm length. **9–12.** *Weilandipoma macayaense* new species. **9–10.** Holotype UF 451540, near Morne Cavalier, 1 km W of Cay Michel, 9.1 mm length; **11.** Paratype OSUM 37269, Citadelle de Platons. 9.0 mm length; **12.** Paratype BMSM 17936, near Morne Cavalier, 1 km W of Cay Michel, 7.4 mm length. **13–17.** *Weilandipoma gonavense* Bartsch, 1946. **13.** Grego coll., Mt. Formón, 8.7 mm length. **14.** Grego coll., Citadelle de Platons. 10.6 mm length; **15.** Grego coll. Mt. Formón. 9.9 mm length. **16.** Grego coll. Mt. Formón, 8.9 mm length. **17.** Grego coll., Mt. Ouasac, 17 mm length. **18.** Radula of *Weilandipoma smithianum* (Pfeiffer, 1866), UF 48134, Plaine Sa Wo. **19.** Distribution of *Weilandipoma*. Areas are approximations. **A** – *W. meridianum* Bartsch, 1946. **B** – *W. milleri* Bartsch, 1946. **C** – *W. blandii* (Weinland, 1880). **D** – *W. orcuttii* Bartsch, 1946. **E** – *W. strictocostatum* (Maltzan, 1885). **F** – *W. excisum* Bartsch, 1946. **G** – *W. gonavense gonavense* (Weinland, 1880). **H** – *W. gonavense* ssp. of Bartsch, 1946. **I** – *W. gonavense conceptum* Bartsch, 1946. **J** – *W. gonavense robustum* Barstch, 1946. **K** – *W. smithianum* (Pfeiffer, 1866), *W. macayaense* new species, *W. auduboni* new species. Base map courtesy of NASA.

Choanopoma smithianum Pfeiffer, 1866. Kobelt, 1880: 277; Crosse, 1891: 165.

Redescription: Shell small (neotype 9.6 mm length, decollate \times 5.8 mm maximum width including peristome), elongate conic. Protoconch unknown, decollate in adults. Teleoconch of 4–4.25 whorls. Axial sculpture of weakly scalloped or undulating cords, regularly spaced, 65–75 on final whorl, more widely spaced on early whorls. On final and penultimate whorls these are grouped in bundles of 4–5 cords where first cord is barely discernible and then each subsequent one increases in size until last cord is longest, then series begins again; this results in an smoothly undulating sutural line. Sculpture is more randomly spaced on earlier whorls. Primary spiral sculpture present only as very weakly scalloped margins of axial cords on earliest whorls and in umbilicus resulting in an angular aspect to base. Secondary spiral sculpture of numerous, microscopic threads between axial cords, often worn away. Suture strongly indented. Aperture double (rarely single), circular (3.5 mm in maximum width in neotype), barely adnate. Inner lip smooth, erect. Outer lip broadly expanded, slightly narrower facing umbilicus, consisting of numerous fused lamella, slightly auriculate. Shell dirty white to pale lavender with 7–8 spiral rows of brown spots and dashes; spots do not continue as bands over lip. Operculum multispiral with a slightly oblique, erect calcareous lamella. Radula taenioglossate with digitate first marginal (Figure 18).

Neotype: NHMUK 20120258 (Figures 2, 3).

Type Locality: The neotype is from the type locality “in monte Platon insulae Haiti,” here interpreted as Citadelle de Platons, specifically the cleared area around the fortress, 727 m elevation, Department du Sud, Haiti, 18.2702° N, –73.9709° W.

Distribution: Specimens are only known from the type locality, Pic Formón, and near Camp Perrin (UF 32254, 48134). It probably has a narrow range in the southern foothills of the Pic Macaya range of the Massif de la Hotte.

Variation in specimens: Ninety specimens seen. The degree of color pattern intensity varies from dark to barely discernible.

Comparison with Other Species: *Weinlandipoma smithianum*, *W. macayaense*, and *W. auduboni* are most similar to each other and to *W. orcuttii* Bartsch, 1946, described from a hill north of Coteaux. That species is distributed along the southwestern edge of the Tiburon Peninsula from Coteaux to as far east as Aquin. It appears to be a coastal, lowland species whereas *W. smithianum*, *W. macayaense*, and *W. auduboni* are montane. *Weinlandipoma orcuttii* differs from *W. smithianum*, *W. macayaense*, and *W. auduboni* in sculptural differences. In *W. orcuttii* the axial ribs produce swollen sutural cusps of a uniform length resulting in a regular, even row of denticles lining the suture. In *W. smithianum*, *W.*

macayaense, and *W. auduboni* these ribs are not of uniform length and are gathered in bundles forming an undulating or ragged row of denticles at the suture. *Weinlandipoma smithianum*, *W. macayaense*, and *W. auduboni* also bear a striking resemblance to *Articulipoma fluxum* (Bartsch, 1946), a species Bartsch described as “exceedingly puzzling” (p. 48). It extends across most of the Tiburon Peninsula from Port-au-Prince to Les Cayes but has not been found in the Citadelle de Platons area. It differs from *Weinlandipoma* in having a paucispiral, flat, chondroid operculum rather than a multispiral operculum with an erect lamella and in lacking microscopic spiral threads between the axial sculpture. However, the overall shell sculpture is very similar.

Weinlandipoma smithianum differs from *W. auduboni* and *W. macayaense* in being larger with much weaker scalloped axial sculpture, a peculiar pattern of sutural sculpture, and a barely adnate aperture.

Weinlandipoma auduboni new species

(Figures 5–8)

Description: Shell small (holotype 7.6 mm length, decollate \times 4.4 mm maximum width including peristome), short conic. Protoconch lost in all examples. Teleoconch of 3.75 whorls. Axial sculpture of undulating and strongly scalloped, narrow, erect lamella, 60–70 on final whorl, more widely spaced on early whorls. These are often grouped in bundles of 2–3 lamella into unfused cusps at suture, separated by a wide space containing 1–3 very fine threads that do not form cusps, but this pattern is not consistent on entire shell; this results in a ragged sutural line. Sculpture is more widely spaced on earlier whorls. Primary spiral sculpture present only as strongly scalloped margins of axial lamella; three scallops on spire whorls, seven on final whorl, three of these are prominent in umbilicus. Secondary spiral sculpture of numerous, microscopic threads between axial lamella, often worn away. Suture strongly indented. Aperture double, circular (2.7 mm in maximum width in holotype), always solute. Inner lip smooth, slightly erect. Outer lip expanded, narrower facing umbilicus, consisting of fine, fused lamella, slightly auriculate. Shell dirty white with 6–7 spiral rows of widely separated, small, brown spots and dashes axially aligned; spots continue as bands over both sides of lip and form spots on inner lip. Operculum multispiral with a vertical, erect calcareous lamella.

Holotype: UF 451538.

Type locality: Near Morne Cavalier, 1 km W of Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,191 m elevation, Department du Sud, Haiti, 18.3267° N, –74.0299° W.

Paratypes: UF 451541, near Morne Cavalier, foot of Mount Ouasac 1,341 m elevation, Department du Sud, Haiti, 18.3391° N, –74.0304° W (1 specimen); OSUM 37268, Citadelle de Platons, cleared area around fortress, 727 m elevation, Department du Sud, Haiti, 18.2702° N,

–73.9709° W (1 specimen); BMSM 17935, near Morne Cavalier, 1 km W of Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,191 m elevation, Department du Sud, Haiti, 18.3267° N, –74.0297° W (1 specimen).

Other Material Examined: Grego coll., Pic Ouasac, Parc National Pic Macaya, deforested pine slope, 1,818 m elevation, 18.3519° N, –74.0282° W (14 specimens); Grego coll., near Morne Cavalier, sinkholes in wet limestone forest, 1,116 m elevation, 18.3227° N, –74.0204° W (3 specimens); Grego coll., near Morn Cavalier, foot of Mt. Ouasac, wet limestone outcrops in cleared forest, 1,341 m elevation, 18.3391° N, –74.0304° W (3 specimens).

Distribution: Known from Morn Cavalier and Citadelle de Platons between 727–1,818 m elevation; it probably occurs throughout the middle elevations of the Pic Macaya range.

Variation in Specimens: Twenty-four specimens seen. The examples we have seen are very uniform in their characteristics, differing only in the number of axial lamella (60–70).

Comparison with Other Species. *Weinlandipoma auduboni* differs from *W. macayaense* in being smaller (6.2–7.2 mm decollate length vs. 7.2–9.6 mm for *W. macayaense*), in having coarser sculpture, and in having fewer axial lamella (60–70 vs. 70–90 for *W. macayaense*).

Etymology: Named for John James Audubon (1785–1851), ornithologist, naturalist, and painter who was born at nearby Les Cayes, and for the Société Audubon d'Haiti, without whose assistance these collections could not have been made.

***Weinlandipoma macayaense* new species**
(Figures 9–12)

Description: Shell small (holotype 9.1 mm length, decollate × 5.4 mm maximum width including peristome), elongate conic. Protoconch of 1.75 smooth, prominent whorls, usually decollate in adults. Teleoconch of 3.75–4 whorls. Axial sculpture of scalloped lamella, 70–90 on final whorl, more widely spaced on early whorls. On final and penultimate whorls these are grouped in bundles of 3–5 cords with wide spaces between bundles having 1–5 fine threads. Sculpture is more randomly spaced on earlier whorls. Primary spiral sculpture present only as scalloped margins of axial; 3–4 scallops on spire whorls, 7–8 on final whorl, three pronounced scalloped cords in umbilicus. Secondary spiral sculpture of numerous, microscopic threads between axial cords, often worn away. Suture strongly indented. Aperture double, circular (2.8 mm in maximum width in neotype), barely solute. Inner lip smooth, erect. Outer lip expanded, narrower facing umbilicus, consisting of about five narrow, erect lamella, slightly auriculate. Shell dirty white with 6–7 spiral rows of widely separated, small, brown spots axially aligned;

spots continue as bands over both sides of lip and form spots on inner lip. Operculum multispiral with a vertical, erect calcareous lamella.

Holotype: UF 451540.

Type locality: Near Morne Cavalier, Parc National Pic Macaya, 1 km W of Cay Michel, wet limestone outcrops, 1,191 m elevation, Department du Sud, Haiti, 18.3267° N, –74.0299° W.

Paratypes: UF 451537, Pic Formón, off path between Morne Cavalier and Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,202 m elevation, Department du Sud, Haiti, 18.3254° N, –74.0262° W (1 specimen); OSUM 37269, Citadelle de Platons, cleared area around fortress, 727 m elevation, Department du Sud, Haiti, 18.2702° N, –73.9709° W (1 specimen); BMSM 17936, near Morne Cavalier, 1 km W of Cay Michel, wet limestone outcrops, 1,191 m elevation, Department du Sud, Haiti, 18.3267° N, –74.0299° W (1 specimen); OSUM 37270, near Morn Cavalier, Parc National Pic Macaya, foot of Mt. Ouasac, wet limestone outcrops in cleared forest, Department du Sud, Haiti, 1,341 m elevation, 18.3391° N, –74.0304° W (1 specimen).

Other Material Examined: Grego coll., Pic Formón, off path between Morne Cavalier and Cay Michel, Parc National Pic Macaya, wet limestone outcrops, 1,202 m elevation, 18.3254° N, –74.0262° W (8 specimens); Grego coll., near Morne Cavalier, Parc National Pic Macaya, 1 km W of Cay Michel, wet limestone outcrops, 1,191 m elevation, Department du Sud, Haiti, 18.3267° N, –74.0299° W (4 specimens); Grego coll., near Morne Cavalier, sinkholes in wet limestone forest, 1,116 m elevation, 18.3227° N, –74.0204° W (10 specimens); Grego coll., GTW 15157a, near Morn Cavalier, foot of Mt. Ouasac, wet limestone outcrops in cleared forest, 1,341 m elevation, 18.3391° N, –74.0304° W (4 specimens).

Distribution: Known only from the vicinity of Citadelle de Platons and Morn Cavalier at 727–1,341 m elevation.

Variation in specimens: Thirty-one specimens seen. The examples we have seen are very uniform in their characteristics, differing only in the number of axial lamellae (70–90).

Comparison with Other Species: See under *W. smithianum*, above.

Etymology: *L. macayaense*, from the area of Parc National Pic Macaya.

DISCUSSION

We have only Pfeiffer's unfigured description of *Choanopoua? smithianum* on which to base this species. Only four species, which we will refer to here as Species A, B, C, and D, were found at the type locality and surrounding areas (27 sites) despite careful examination.

All are members of *Weinlandipoma*. Pfeiffer's description, taken as a whole, contains enough information to identify which of these species represents *C. smithianum* based on circumstantial evidence. We present all available evidence below.

- (1) Pfeiffer's description mentions his specimen being 11.5 mm long by 6 mm wide giving a length/width ratio = 1.9. Species A has a ratio of 1.7–1.9. Species B is more turbinate with a ratio of 1.2. Species C has a ratio of 1.4–1.7. Species D is 1.6–1.9. The length/width ratio of Pfeiffer's specimen most closely matches Species A and D.
- (2) Pfeiffer's description mentions his specimen being 11.5 mm long in decollate length. Our specimens of Species A vary from 9.0–11.0 mm in decollate length. Species B varies from 8.8–11.3 mm in decollate length. Species C is the smallest with specimens ranging from 6.2–7.2 mm in decollate length. Species D is 7.2–9.6 mm in decollate length. The decollate length of Pfeiffer's specimen most closely matches Species A and B.
- (3) Pfeiffer (1866: 88) referred to "*sutura costis excurrentibus irregulariter crenata*" in his original description. Species B has a set of cusps lining the suture of a uniform height, but often alternating with a smaller thread. Species A, C, and D have an undulating row of cusps of various lengths. Unfortunately, all four species could fit Pfeiffer's description.
- (4) Pfeiffer compared his species with *Cyclostoma serraticosta* Weinland, 1862 and *Choanopoma puertoplatense* Pfeiffer, 1858. The former species was regarded as *Orcuttipoma rollei serraticosta* by Bartsch (1946), and as *Parachondria rollei serraticostus* by Watters (2006). The latter species was overlooked by Bartsch (1946) and Watters (2006) suggested it might be a *Colonina* based on the apparent spiral cords in the original minute (10 mm) illustration. (However, in view of Pfeiffer's comparison it is more likely that the spiral lines are bands of color rather than sculpture; this would eliminate this species from *Colonina* but the generic placement remains unknown as the type has not been located.) Pfeiffer also included where he would have placed his species in the 1865 second supplement to his *Monographia pneumonoporum viventium*; he placed it at "7 1/2," in between *Cistula tractum* "Gundlach" (species 7) and *Choanopoma puertoplatense* (species 8). Both of these species resemble Species A, C, and D more so than Species B in having a prominent color pattern; however the same color pattern does occur in Species B but it is not as well-defined. Again, Pfeiffer's description of "*seriebus punctorum ruforum ornata*" could apply to any of the four species.
- (5) Pfeiffer makes no note of the strongly scalloped axial cords seen in Species C and D.
- (6) The outer lip is narrowly adnate in Pfeiffer's description of *C. smithianum*. Only Species A and B have adnate outer lips.

- (7) The peculiar folded lamella of the peristome found in Species B, particularly in the Citadelle de Platons specimens, not seen in any other species of the genus, would certainly have been noted by Pfeiffer.
- (8) Species D has not been found at the type locality.

Based on sculptural aspects, size, and degree of elongation we believe only Species A could fit the description of *Choanopoma* ? *smithianum* Pfeiffer, 1866. Species B is *W. gonavense* (Weinland, 1880), species C is *W. auduboni* and D is *W. macayaense*.

Weinlandipoma is restricted to the lower and middle elevations of the Chaîne de la Selle mountain range, which forms the Tiburon Peninsula and continues into the Barahona Peninsula as the Sierra de Baoruco (Figure 19). It is also found on the neighboring islands of Île de la Gonâve, Petite Gonâve, and Île à Vache. Species occur from Polo in the eastern Barahona Peninsula and Port-au-Prince across the Tiburon Peninsula to its western end. This mountain range originated apart from the rest of Hispaniola and continues to collide with it (with recently disastrous results). The mountain range harbors many unique species and genera of Annulariidae that do not seem to have counterparts in the remainder of Hispaniola. Watters (2006) hypothesized that these taxa evolved on what is now the Tiburon Peninsula before it merged with Hispaniola and that its taxa are not related to those on the rest of the island.

The radula of *Weinlandipoma* is typical of most annulariids, having a digitate first marginal (Figure 18). It is this tooth that varies most in the family (previously unpublished). Genetic studies of the Annulariidae are now being completed.

Weinlandipoma smithianum, *W. macayaense*, and *W. auduboni* may co-occur with *W. gonavense*, although *W. gonavense* appears to be more widespread. *Weinlandipoma smithianum* has been found in the vicinity of Camp Perrin at 200–210 m elevation (UF 32269, 48134), Citadelle de Platons at 727 m elevation, and at Pic Formón at 1,202 m elevation; it appears to occur at lower elevations than *W. auduboni* and *W. macayaense*. *Weinlandipoma auduboni* and *W. macayaense* are found near Morn Cavalier and Citadelle de Platons between 727–1400 m elevation. These sites have wet limestone outcrops and sinkholes in pine forests on the south slope of the Pic Macaya range (although much of this area has been deforested). Most of the sites are located within the Parc National Pic Macaya, which includes the last virgin cloud forest in Haiti and has as an extremely high level of endemism of plants and animals (Thompson, 1986; Grego and Šteffek, 2007; Fernández, 2007). *Weinlandipoma macayaense* and *W. auduboni* are sometimes, but not always, found together. The condition of the specimens does not permit a morphological examination of the genitalia but it is unlikely that the two species represent sexually dimorphic forms of one species; sexual dimorphism in shells is unknown in Hispaniolan annulariids.

Weinlandipoma gonavense is characterized by a peculiar apertural feature that is lacking in all other members

of the genus (Figures 13–17). Several of the lamella composing the outer lip are erect and folded back over toward the aperture to various degrees, sometimes forming a shelf. These folded lamella are usually among the middle lamella (although in some populations the lamella are outermost) and usually arise from the inner (axial) portion of the lip. The degree of folding varies considerably between and among populations, rarely absent, but is prominent in the Citadelle de Platons specimens. Specimens also vary in size, height, and color. This variability caused Grego and Šteffek (2007) to suggest that additional species occurred at their study sites. Thompson (1986) referred these taxa to *Weinlandipoma* sp. Bartsch (1946) divided this taxon into four subspecies, including one he did not formally name. These subspecies ranged from Île de la Gonâve to the southwestern coast of the Tiburon Peninsula. There appear to be two distinct forms in our study areas, one tall and pale that conforms to Bartsch's subspecies *conceptum*, the other short and dark and unnamed; some sites have both forms, others only one. Both forms have folded aperture lamella. However, a few specimens appear to be intermediate between the two groups. At this time we are referring to these specimens as *W. gonavense* s.l. although clearly more work is needed. A living individual of *W. gonavense* was figured in Fernández (2007, p. 195).

We believe the designation of a neotype of *Choanopoma* ? *smithianum* Pfeiffer, 1866, for the purpose of clarifying its taxonomic status is warranted at this time. The species seems to have a much narrower range than *Weinlandipoma gonavense*, with which it is occasionally found and potentially confused. It may be a significantly rare taxon deserving conservation protection that has not been recognized because of the lack of illustration or type specimens. Portions of its range have already been deforested. A neotype is chosen from the type locality and deposited at the Natural History Museum, London, UK as NHMUK 20120258. The type locality of "in monte Platon insulae Haiti" is here amplified as Citadelle de Platons, cleared area around fortress, 727 m elevation, Department du Sud, Haiti, 18.2702° N, -73.9709° W.

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